MEMORANDUM

TO: ICCR Coordinating Committee
ICCR Source Workgroup Chairs

FROM: Michael Wax, ICCR Testing and Monitoring Protocol Workgroup (TMPWG)

RE: Draft Stack Testing Cost Model

DATE: July 7, 1997

Attached is a **draft** cost model prepared by the TMPWG for estimating the costs of gap-filling testing of industrial combustion source air toxics emissions. Please read the discussion and warnings below before using the model.

APPROACH: Based on a preliminary assessment by the TMPWG, the air toxics emissions from industrial sources fall into four categories:

- pollutants emitted by all sources (acetaldehyde, acrolein, benzene, ethylbenzene, formaldehyde, naphthalene, styrene, toluene, xylene, polycyclic organic matter);
- pollutants emitted by many, but not all, sources (biphenyl, 1,3-butadiene, 1,4-dioxane, hexane, methanol, phenol, propionaldehyde);
- pollutants emitted when chlorine is present (carbon tetrachloride, chloroform, 1,4-dichlorobenzene, ethylene dichloride, methyl chloroform, methylene chloride, tetrachloroethylene, trichloroethylene, vinyl chloride, vinylidene chloride); and,
- other pollutants emitted from specific sources depending on the fuel (dioxins/ furans, polychlorinated biphenyls, HCl, metals).

Unfortunately, these groups do not fit the methods the stack testers use. Further, different methods seem to be preferred for different source types.

What we have done instead is to get prices for the different methods which a stack tester would use to measure emissions of the above pollutants. We have not tried to estimate the differences in the costs of these methods for different source types and fuels: these variables will have relatively small effects on costs.

The table below contains the range of costs based on the information obtained from the two testing companies who have responded to our request for information so far. We are in the process of obtaining additional information. When we have data from enough companies to assure their anonymity, we will list the names of the respondents.

HOW TO USE THE INFORMATION: The first entry in the table is for the cost of testing for semi-volatile compounds which are emitted by most industrial combustion

sources. (While the chlorinated compound included here might not be emitted from all sources, the incremental cost of the lab work associated with testing for this compound is small compared with the uncertainty of a budgetary quote.) This cost includes the cost of transportation to and set-up at the test site.

The rest of the table entries are *incremental* costs for measuring specific pollutants, *which assume that the testing company is already on site for the SVOST covered by the first entry*. In other words, these later entries do not cover transportation and set-up.

Note that multiple tests are given for some pollutants to allow for different preferences in different industries. Note also that there are no costs for FTIR, as we have not yet obtained sufficient information to estimate these.

To estimate the cost of testing for a set of compounds at a site, add the cost of base testing and any other testing necessary to cover the compounds of interest. Remember that you *must* include the base testing to catch the cost of travel and set up.

WARNINGS: (1) The attached model is a draft, and is subject to change. Please contact the TMPWG to obtain the most up-to-date information.

(2) This model is to be used only to estimate the costs of gap-filling testing. It is not to be used to estimate the costs of compliance testing. The TMPWG will develop a cost model more appropriate for estimating compliance testing later.

(3) Mention of specific test methods does not mean that the TMPWG endorses these test methods. We included specific methods to give some idea of approximate costs. The TMPWG will be happy to work with individual source workgroups to identify appropriate test methods for specific applications.

COMMENTS: This is a draft. Please contact the TMPWG to let us know how we can improve this cost model to better meet the needs of specific source work groups.

DRAFT 7/7/97

ICCR Testing and Monitoring Protocol Workgroup - Testing Cost Model

Do not use this information without reading the discussion/warnings in the cover letter!

Test Method	Estimated Cost for Three Runs
base testing: SVOST Method (SW-846 0010, CARB 429, or equivalent) [5 compounds]	6,000-11,150[a]
add VOST Method (SW-846 0030, CARB 422, or equivalent), [14 compounds]	2,900-4,900
add GC Analysis (EPA 18/TO-14[b]) [18 compounds]	1,500-3,900
add DNPH Method (CARB 430, BIF 0011, or equivalent) [4 compounds]	3,600-4,100
add FTIR Analysis [5 compounds]	
add dioxin/furan analysis of SVOST sample	4,650-6,500
add PCB analysis of SVOST sample	2,000-2,200
add method 26 [HCl]	2,000-2,300
add method 29 [11 metals: antimony, arsenic, beryllium, cadmium, chromium, cobalt, lead, manganese, mercury, nickel, selenium]	3,950-4,200

[a] The cost of base testing includes the costs of travel to and set-up at the test site. Costs for other tests do not cover travel and site set-up, and assume that the testing company is already on site to do the base testing.

[b] TO-14 is an ambient method, but has been used in combination with method 18 sampling to collect HAP data.

DRAFT **Representative Compounds for Analysis**

SVOST Method (SW-846 0010, CARB 429, or equivalent)
biphenyl
1,4-dichlorobenzene
naphthalene
phenol
polycyclic organic matter

VOST Method (SW-846 0030, CARB 422, or equivalent)	**GC Analysis (EPA 18/TO-14)**
benzene	benzene
	1,3-butadiene
carbon tetrachloride	carbon tetrachloride
chloroform	chloroform
	1,4-dichlorobenzene
	1,4-dioxane
ethylbenzene	ethylbenzene
ethylene dichloride	ethylene dichloride
n-hexane	n-hexane
	methanol
methyl chloroform	methyl chloroform
methylene chloride	methylene chloride
styrene	styrene
tetrachloroethylene	tetrachloroethylene
toluene	toluene
trichloroethylene	trichloroethylene
vinyl chloride	vinyl chloride
xylenes	xylenes

DNPH Method (CARB 430, BIF 0011, or equivalent)	**FTIR Analysis**
acetaldehyde	acetaldehyde
acrolein	acrolein
formaldehyde	formaldehyde
propionaldehyde	propionaldehyde
	methanol